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Color display device has color adjustment unit which controls drive units respectively connected to each light emitting diode, for emitting mixed light of desired hue

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Novelty: Three light emitting diodes coaxially provided in trichromatic luminescent element (11), respectively radiate light of primary colors. The drive units (20) respectively connected to each light emitting diode, are controlled by color adjustment unit (30) so that mixed light of desired hue is emitted.

Use: Color display device for radiating light of desired hue.

Advantage: As the color adjustment unit suitably controls drive units respectively connected to each light emitting diode, the radiation of mixed light of desired hue is enabled and hence non-uniformity of color display is prevented. As the radiation of light from each light emitting diode is performed along same optical axis, light distribution is equal.

Description of Drawing(s): The figure shows the block diagram of color display device.

Trichromatic luminescent element 11

Drive unit 20

Color adjustment unit 30

(5pp Dwg.No.1/8)

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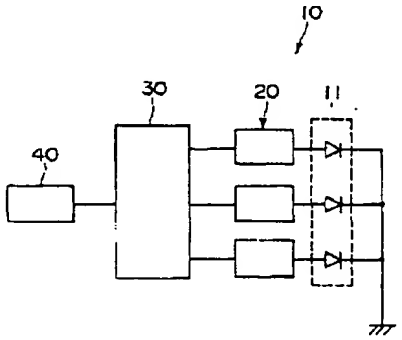

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DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[The technical field to which invention belongs] This invention relates to the color display which was made to carry out outgoing radiation of the light of a desired color tone.
[0002]
[Description of the Prior Art] When emitting light in a desired color tone by light emitting diode (henceforth Light Emitting Diode) conventionally, it is made to make the light of a desired color tone emit light by arranging mutually closely three sorts of Light Emitting Diodes which carry out outgoing radiation of the light of each color of the three primary colors of light, for example, red, green, and blue, carrying out drive control of each Light Emitting Diode suitably, respectively, and making each Light Emitting Diode emit light by predetermined luminous intensity.
[0003]
[Problem(s) to be Solved by the Invention] However, though Light Emitting Diode of each color was arranged closely mutually, since a certain amount of distance was between Light Emitting Diodes of each color, generating of color nonuniformity is unescapable and, locally, there was a problem of becoming the color tone [color tone / desired] shifted.
[0004] This invention aims at offering the color display use [display] Light Emitting Diode, and there is [display] no color nonuniformity in view of the above point, and it was made to make the light of a desired color tone emit light correctly.
[0005]
[Means for Solving the Problem] In order to attain the above-mentioned purpose, the color display by this invention is characterized by to provide the 3 color light emitting device mostly equipped with three sorts of light emitting diode chips which carry out outgoing radiation of the light of a mutually different color on the same axle, the mechanical component which drives each chip of this 3 color light emitting device, respectively, and the color tone ready section which carries out drive control of the above-mentioned mechanical component so that a mixed light of a desired color tone may be made to emit light by the above-mentioned 3 color light emitting device.
[0006] The color display by this invention is preferably equipped with three sorts of light emitting diode chips with which the above-mentioned 3 color light emitting device carries out outgoing radiation of the light of each color of light in three primary colors, respectively.
[0007] As for the color display by this invention, the color tone ready section performs drive control of a mechanical component preferably based on the adjustment signal inputted from the outside.
[0008] The color display by this invention is preferably inputted from the control unit to which the above-mentioned adjustment signal performs color tone ready operation about each color.
[0009] The color display by this invention is a signal corresponding to the detecting signal from various sensors in the above-mentioned adjustment signal preferably.
[0010] Preferably, the above-mentioned detecting signal is an analog signal, and the color display by this invention is inputted into the color tone ready section as a back digital adjustment signal by which A/D conversion was carried out.
[0011] Preferably, the above-mentioned detecting signal is an analog signal, and the color display by this invention is inputted into the color tone ready section as a back analog adjustment signal by

which level adjustment was carried out.
[0012] Since according to the above-mentioned composition three sorts of light emitting diode chips which carry out outgoing radiation of a mutually different color in a 3 color light emitting device and the desirable light of each color in three primary colors of light approach mutually and it has them on the same axle mostly, along with the almost same optical axis, outgoing radiation of the light which carried out outgoing radiation from each light emitting diode chip is carried out. Thereby, the luminous-intensity-distribution property of the light of each color which carries out outgoing radiation from each light emitting diode chip becomes almost the same. Therefore, since the color tone by the mixed light of the light from each light emitting diode chip of a 3 color light emitting device is arbitrarily set up by carrying out drive control of the mechanical component corresponding to each light emitting diode chip suitably by the color tone ready section, there is almost no color nonuniformity and the color display of a desired exact color tone is obtained as a whole.
[0013] When the color tone ready section performs drive control of a mechanical component based on the adjustment signal inputted from the outside, when the light of predetermined luminous intensity carries out outgoing radiation from each light emitting diode chip of 3 color light emitting diode, the color display of a predetermined color tone can be performed based on the adjustment signal from the outside.
[0014] When the above-mentioned adjustment signal is inputted from the control unit which performs color tone ready operation about each color, and a user operates a control unit suitably and sets up a desired color tone, the color tone ready section carries out drive control of the mechanical component, and the light of predetermined luminous intensity carries out outgoing radiation from each light emitting diode chip of 3 color light emitting diode. Thereby, the color display of a predetermined color tone can be performed.
[0015] When the above-mentioned adjustment signal is a signal corresponding to the detecting signal from various sensors, corresponding to the level variation of the detecting signal of various sensors, the light of the luminous intensity corresponding to the detecting signal carries out outgoing radiation of the controller by carrying out drive control of the mechanical component from each light emitting diode chip of 3 color light emitting diode. The color display of the color tone which changes by this corresponding to change of the various states which various sensors should detect can be performed.
[0016] Moreover, the above-mentioned detecting signal is an analog signal, and when inputted into the color tone ready section as a back digital adjustment signal by which A/D conversion was carried out, the color tone ready section can control a mechanical component by digital signal processing, and can perform high color adjustment of versatility using a microcomputer etc.
[0017] Furthermore, the above-mentioned detecting signal is an analog signal, and since it ends with easy circuitry amplifying a detecting signal with amplifier or making it decrease by the attenuator, or by inputting into the color tone ready section by proper signal level, without making it amplify or decrease when inputted into the color tone ready section as a back analog adjustment signal by which level adjustment was carried out, cost can be reduced.
[0018]
[Embodiments of the Invention] Hereafter, based on the operation gestalt shown in the drawing, this invention is explained in detail. Drawing 1 or drawing 6 shows the first operation gestalt of the color display by this invention. In drawing 1 , the color display 10 consists of control units 40 which input an adjustment signal into the color tone ready section 30 which carries out drive control of the mechanical component 20 which drives the 3 color light emitting device 11 and this 3 color light emitting device 11, and the mechanical component 20, and the color tone ready section 30.
[0019] The above-mentioned 3 color light emitting device 11 is equipped with three Light Emitting Diode chips 11r, 11g, and 11b which approached the interior mutually and were mostly arranged in it on the same axle while the whole is constituted as one package, as shown in drawing 2 . Electric power is supplied respectively and in independent by carrying out wirebonding to the leadframes 13, 14, and 15 which became independent respectively and mutually while bonding

was carried out to the upper limit of the common leadframe 12, as it was Light Emitting Diode to which each Light Emitting Diode chips 11r, 11g, and 11b carry out outgoing radiation of the three primary colors of light, i.e., red, green, and the blue light, respectively and was shown in drawing 2 , and drive luminescence is carried out. And the above-mentioned Light Emitting Diode chips 11r, 11b, and 11b and near the upper limit of each leadframes 12, 13, 14, and 15 are closed with the transparent closure resin 16.

[0020] Furthermore, the above-mentioned 3 color light emitting device 11 is covered with the lens 17 with which the circumference of the closure resin 16 and the upper part consist of a transparent resin, as shown in drawing 3 and drawing 4 . This lens 17 equips the pars basilaris ossis occipitalis with cylinder-like centrum 17a which has opening, and the 3 color light emitting device 11 is inserted into this centrum 17a. In that case, the 3 color light emitting device 11 is arranged so that the upper limit of the closure resin 16 may have few gaps d to the end face of centrum 17a within centrum 17a. furthermore, the reflection which consists of aluminum foil in order that a lens 17 may prevent the outgoing radiation of the light to the circumference to a downward peripheral surface -- it has the member 18 When the light which carried out outgoing radiation from each Light Emitting Diode chips 11r, 11g, and 11b of the 3 color light emitting device 11 passes through this gap d by this, it is constituted so that the luminous intensity on an optical axis may become high by refraction operation of the closure resin 16 and a lens 17.

[0021] In illustration, the above-mentioned mechanical component 20 is formed to each Light Emitting Diode chips 11r, 11g, and 11b, respectively, supplies electric power to the Light Emitting Diode chips 11r, 11g, and 11b based on the drive control signal which is the respectively same composition and is inputted, and carries out drive luminescence of the Light Emitting Diode chips 11r, 11g, and 11b.

[0022] Here, as shown in drawing 5 , it is a constant-voltage-drive circuit, and a mechanical component 20 carries out the pulse control of the constant voltage Vc supplied based on the drive control signal inputted. The controlled voltage is outputted through the current-limiting resistance R1, and carries out the pulse drive of each Light Emitting Diode chips 11r, 11g, and 11b. A driving pulse is controllable by the well-known proper control methods, such as for example, pulse width control and duty ratio control, in that case. In addition, a mechanical component 20 may be made to carry out the voltage drive of each Light Emitting Diode chips 11r, 11g, and 11b by changing the voltage supplied based on a drive control signal instead of the constant voltage drive mentioned above. Moreover, to be shown in drawing 6 , a mechanical component 20 may be a current regulator circuit, and can control the driver voltage to the Light Emitting Diode chips 11r, 11g, and 11b by amplifying the voltage of the criteria resistance R2 with direct or amplifier 21, and feeding it back as driver voltage of the Light Emitting Diode chips 11r, 11g, and 11b.

[0023] The above-mentioned color tone ready section 30 generates the drive control signal about each color based on the adjustment signal inputted from the outside, i.e., the signal corresponding to the color tone which should indicate by the color, and outputs these drive control signals to the mechanical component 20 corresponding to each color. The drive control signal about each color is obtained by separating the color of the color tone which an adjustment signal expresses about each color.

[0024] By operating the operation tongue about each color, the above-mentioned control unit 40 is constituted so that the adjustment signal corresponding to the color tone which sets up a desired color tone and was set up may be outputted. In addition, when the operation tongue about each color is operated, you may make it a control unit 40 output the adjustment signal about each color. In this case, since the adjustment signal about each color is inputted, it becomes unnecessary color-separation processing the color tone ready section 30.

[0025] The color display 10 by this invention operation gestalt is constituted as mentioned above, and in using it, a user sets up a desired color tone by the control unit 40 first. Thereby, the adjustment signal corresponding to a desired color tone is inputted into the color tone ready section 30 from a control unit 40, and the drive control signal of each color corresponding to a desired color tone is inputted into the mechanical component 20 of a color which corresponds, respectively from the color tone ready section 30. And when drive control of each Light Emitting Diode chips

11r, 11g, and 11b is carried out by the mechanical component 20, light is emitted by proper luminous intensity and outgoing radiation of the light of each color which carried out outgoing radiation from each Light Emitting Diode chips 11r, 11g, and 11b is carried out along the almost same optical-axis top. Thereby, since outgoing radiation of the light of each color is carried out to the exterior in the mutual almost same luminous-intensity-distribution property through the closure resin 15, Gap d, and a lens 16, the color display of a mixed light which does not have color nonuniformity as a whole is performed by mixing the light of each color equally as a whole.

[0026] Drawing 7 shows the composition of the second operation gestalt of the color display by this invention. In drawing 7 , if a point equipped with the sensor 51 and the converter 52 is removed instead of the control unit 40 in the color display 10 shown in drawing 1 , the color display 50 is the same composition as the color display 10, and omits these explanation by giving the same sign to the same component part.

[0027] Although a sensor 51 detects various situations, and corresponds to a situation, a detecting signal is outputted and various sensors, such as a temperature sensor, a humidity sensor, a pressure sensor, a magnetometric sensor, an ultrasonic sensor, and a pyroelectric sensor, are used, the following explanation explains the case of a temperature sensor.

[0028] Based on the detecting signal from a sensor 51, a converter 52 is changed into the change signal of the proper level range, and it is constituted so that it may output to the color tone ready section 30 as an adjustment signal. In addition, only in level change of conversion of the detecting signal of a sensor 51, amplifier or an attenuator is used as a converter 52. In this way, the adjustment signal changed by the converter 52 is set up so that a color tone which changes from blue to red may be shown as temperature becomes high so that the temperature which a temperature sensor 51 should detect is high as shown in drawing 8 for example, and it may become a color tone with high frequency namely.

[0029] According to the color display 50 of such composition, temperature, such as atmospheric temperature, is detected by the temperature sensor 51, and the detecting signal corresponding to the temperature at that time is outputted from a temperature sensor 51. And when this detecting signal is changed by the converter 52, an adjustment signal is outputted to the color tone ready section 30. Thereby, from the color tone ready section 30, if the drive control signal of each color corresponding to the above-mentioned adjustment signal is inputted into the mechanical component 20 of a color which corresponds, respectively, drive control will be carried out by the mechanical component 20, and each Light Emitting Diode chips 11r, 11g, and 11b will emit light by proper luminous intensity. Therefore, the color display of the color tone corresponding to the atmospheric temperature at that time is performed by mixing the light of each color which carried out outgoing radiation from each Light Emitting Diode chips 11r, 11g, and 11b. And when the color display of the color more near blue is performed when atmospheric temperature changed and temperature falls corresponding to this change, and temperature rises, the color display of the color more near red is performed. Thus, atmospheric temperature is visually expressed by color display by performing the color display from which a color tone changes corresponding to change of atmospheric temperature which is used, for example in the weather report and weather situation in television broadcasting, a newspaper, etc. Since outgoing radiation of the light of each color which carried out outgoing radiation is carried out along the almost same optical-axis top from each Light Emitting Diode chips 11r, 11g, and 11b in that case, outgoing radiation of the light of each color is carried out to the exterior in the mutual almost same luminous-intensity-distribution property. For this reason, the color display of a mixed light which does not have color nonuniformity as a whole is performed by mixing the light of each color equally as a whole.

[0030] It is clear that it sets in the operation gestalt mentioned above, and the Light Emitting Diode chip of three colors which carry out outgoing radiation of the light of not only this but a mutually different color may be used although the red, the green, and the blue Light Emitting Diode chips 11r, 11g, and 11b which carry out outgoing radiation of the light of light in three primary colors as Light Emitting Diode chips of the 3 color light emitting device 11 are used. Moreover, although the 3 color light emitting device 11 is equipped with the Light Emitting Diode chips 11r, 11g, and 11b of three colors the piece every, respectively, you may make it mutually

equipped with the Light Emitting Diode chips 11r, 1g, and 11b of the same number in the above-mentioned operation gestalt. According to this invention, the various equipments which met the chromaticity diagram announced in CIE (Commission Internationale de l'Eclariage) using the sensor are realizable.

[0031]

[Effect of the Invention] Along with the almost same optical axis, outgoing radiation of the light which carried out outgoing radiation from each light emitting diode chip since three sorts of light emitting diode chips which carry out outgoing radiation of a color which is [like] mutually [within a 3 color light emitting device] different according to this invention and a desirable light of each color in three primary colors of light which were described above approached mutually and it had them on the same axle mostly is carried out. Thereby, the luminous-intensity-distribution property of the light of each color which carries out outgoing radiation from each light emitting diode chip becomes almost the same. Therefore, since the color tone by the mixed light of the light from each light emitting diode chip of a 3 color light emitting device is arbitrarily set up when the color tone ready section carries out drive control of the mechanical component corresponding to each light emitting diode chip suitably, there is almost no color nonuniformity and the color display of a desired exact color tone is obtained as a whole. Thus, according to this invention, the extremely excellent color display use [display] Light Emitting Diode, and there is [display] no color nonuniformity, and it was made to make the light of a desired color tone emit light correctly will be offered.

[Translation done.]

DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[The technical field to which invention belongs] This invention relates to the color display which was made to carry out outgoing radiation of the light of a desired color tone.

[0002]

[Description of the Prior Art] When emitting light in a desired color tone by light emitting diode (henceforth Light Emitting Diode) conventionally, it is made to make the light of a desired color tone emit light by arranging mutually closely three sorts of Light Emitting Diodes which carry out outgoing radiation of the light of each color of the three primary colors of light, for example, red, green, and blue, carrying out drive control of each Light Emitting Diode suitably, respectively, and making each Light Emitting Diode emit light by predetermined luminous intensity.

[0003]

[Problem(s) to be Solved by the Invention] However, though Light Emitting Diode of each color was arranged closely mutually, since a certain amount of distance was between Light Emitting Diodes of each color, generating of color nonuniformity is unescapable and, locally, there was a problem of becoming the color tone [color tone / desired] shifted.

[0004] This invention aims at offering the color display use [display] Light Emitting Diode, and there is [display] no color nonuniformity in view of the above point, and it was made to make the light of a desired color tone emit light correctly.

[0005]

[Means for Solving the Problem] In order to attain the above-mentioned purpose, the color display by this invention is characterized by to provide the 3 color light emitting device mostly equipped with three sorts of light emitting diode chips which carry out outgoing radiation of the light of a mutually different color on the same axle, the mechanical component which drives each chip of this 3 color light emitting device, respectively, and the color tone ready section which carries out drive control of the above-mentioned mechanical component so that a mixed light of a desired color tone may be made to emit light by the above-mentioned 3 color light emitting device.

[0006] The color display by this invention is preferably equipped with three sorts of light emitting diode chips with which the above-mentioned 3 color light emitting device carries out outgoing radiation of the light of each color of light in three primary colors, respectively.

[0007] As for the color display by this invention, the color tone ready section performs drive control of a mechanical component preferably based on the adjustment signal inputted from the outside.

[0008] The color display by this invention is preferably inputted from the control unit to which the above-mentioned adjustment signal performs color tone ready operation about each color.

[0009] The color display by this invention is a signal corresponding to the detecting signal from various sensors in the above-mentioned adjustment signal preferably.

[0010] Preferably, the above-mentioned detecting signal is an analog signal, and the color display by this invention is inputted into the color tone ready section as a back digital adjustment signal by which A/D conversion was carried out.

[0011] Preferably, the above-mentioned detecting signal is an analog signal, and the color display by this invention is inputted into the color tone ready section as a back analog adjustment signal by which level adjustment was carried out.

[0012] Since according to the above-mentioned composition three sorts of light emitting diode chips which carry out outgoing radiation of a mutually different color in a 3 color light emitting device and the desirable light of each color in three primary colors of light approach mutually and it has them on the same axle mostly, along with the almost same optical axis, outgoing radiation of the light which carried out outgoing radiation from each light emitting diode chip is carried out. Thereby, the luminous-intensity-distribution property of the light of each color which carries out outgoing radiation from each light emitting diode chip becomes almost the same. Therefore, since the color tone by the mixed light of the light from each light emitting diode chip of a 3 color light emitting device is arbitrarily set up by carrying out drive control of the mechanical component

corresponding to each light emitting diode chip suitably by the color tone ready section, there is almost no color nonuniformity and the color display of a desired exact color tone is obtained as a whole.

[0013] When the color tone ready section performs drive control of a mechanical component based on the adjustment signal inputted from the outside, when the light of predetermined luminous intensity carries out outgoing radiation from each light emitting diode chip of 3 color light emitting diode, the color display of a predetermined color tone can be performed based on the adjustment signal from the outside.

[0014] When the above-mentioned adjustment signal is inputted from the control unit which performs color tone ready operation about each color, and a user operates a control unit suitably and sets up a desired color tone, the color tone ready section carries out drive control of the mechanical component, and the light of predetermined luminous intensity carries out outgoing radiation from each light emitting diode chip of 3 color light emitting diode. Thereby, the color display of a predetermined color tone can be performed.

[0015] When the above-mentioned adjustment signal is a signal corresponding to the detecting signal from various sensors, corresponding to the level variation of the detecting signal of various sensors, the light of the luminous intensity corresponding to the detecting signal carries out outgoing radiation of the controller by carrying out drive control of the mechanical component from each light emitting diode chip of 3 color light emitting diode. The color display of the color tone which changes by this corresponding to change of the various states which various sensors should detect can be performed.

[0016] Moreover, the above-mentioned detecting signal is an analog signal, and when inputted into the color tone ready section as a back digital adjustment signal by which A/D conversion was carried out, the color tone ready section can control a mechanical component by digital signal processing, and can perform high color adjustment of versatility using a microcomputer etc.

[0017] Furthermore, the above-mentioned detecting signal is an analog signal, and since it ends with easy circuitry amplifying a detecting signal with amplifier or making it decrease by the attenuator, or by inputting into the color tone ready section by proper signal level, without making it amplify or decrease when inputted into the color tone ready section as a back analog adjustment signal by which level adjustment was carried out, cost can be reduced.

[0018]

[Embodiments of the Invention] Hereafter, based on the operation gestalt shown in the drawing, this invention is explained in detail. Drawing 1 or drawing 6 shows the first operation gestalt of the color display by this invention. In drawing 1 , the color display 10 consists of control units 40 which input an adjustment signal into the color tone ready section 30 which carries out drive control of the mechanical component 20 which drives the 3 color light emitting device 11 and this 3 color light emitting device 11, and the mechanical component 20, and the color tone ready section 30.

[0019] The above-mentioned 3 color light emitting device 11 is equipped with three Light Emitting Diode chips 11r, 11g, and 11b which approached the interior mutually and were mostly arranged in it on the same axle while the whole is constituted as one package, as shown in drawing 2 . Electric power is supplied respectively and in independent by carrying out wirebonding to the leadframes 13, 14, and 15 which became independent respectively and mutually while bonding was carried out to the upper limit of the common leadframe 12, as it was Light Emitting Diode to which each Light Emitting Diode chips 11r, 11g, and 11b carry out outgoing radiation of the three primary colors of light, i.e., red, green, and the blue light, respectively and was shown in drawing 2 , and drive luminescence is carried out. And the above-mentioned Light Emitting Diode chips 11r, 11b, and 11b and near the upper limit of each leadframes 12, 13, 14, and 15 are closed with the transparent closure resin 16.

[0020] Furthermore, the above-mentioned 3 color light emitting device 11 is covered with the lens 17 with which the circumference of the closure resin 16 and the upper part consist of a transparent resin, as shown in drawing 3 and drawing 4 . This lens 17 equips the pars basilaris ossis occipitalis with cylinder-like centrum 17a which has opening, and the 3 color light emitting device 11 is

inserted into this centrum 17a. In that case, the 3 color light emitting device 11 is arranged so that the upper limit of the closure resin 16 may have few gaps d to the end face of centrum 17a within centrum 17a. furthermore, the reflection which consists of aluminum foil in order that a lens 17 may prevent the outgoing radiation of the light to the circumference to a downward peripheral surface -- it has the member 18 When the light which carried out outgoing radiation from each Light Emitting Diode chips 11r, 11g, and 11b of the 3 color light emitting device 11 passes through this gap d by this, it is constituted so that the luminous intensity on an optical axis may become high by refraction operation of the closure resin 16 and a lens 17.

[0021] In illustration, the above-mentioned mechanical component 20 is formed to each Light Emitting Diode chips 11r, 11g, and 11b, respectively, supplies electric power to the Light Emitting Diode chips 11r, 11g, and 11b based on the drive control signal which is the respectively same composition and is inputted, and carries out drive luminescence of the Light Emitting Diode chips 11r, 11g, and 11b.

[0022] Here, as shown in drawing 5 , it is a constant-voltage-drive circuit, and a mechanical component 20 carries out the pulse control of the constant voltage Vc supplied based on the drive control signal inputted. The controlled voltage is outputted through the current-limiting resistance R1, and carries out the pulse drive of each Light Emitting Diode chips 11r, 11g, and 11b. A driving pulse is controllable by the well-known proper control methods, such as for example, pulse width control and duty ratio control, in that case. In addition, a mechanical component 20 may be made to carry out the voltage drive of each Light Emitting Diode chips 11r, 11g, and 11b by changing the voltage supplied based on a drive control signal instead of the constant voltage drive mentioned above. Moreover, to be shown in drawing 6 , a mechanical component 20 may be a current regulator circuit, and can control the driver voltage to the Light Emitting Diode chips 11r, 11g, and 11b by amplifying the voltage of the criteria resistance R2 with direct or amplifier 21, and feeding it back as driver voltage of the Light Emitting Diode chips 11r, 11g, and 11b.

[0023] The above-mentioned color tone ready section 30 generates the drive control signal about each color based on the adjustment signal inputted from the outside, i.e., the signal corresponding to the color tone which should indicate by the color, and outputs these drive control signals to the mechanical component 20 corresponding to each color. The drive control signal about each color is obtained by separating the color of the color tone which an adjustment signal expresses about each color.

[0024] By operating the operation tongue about each color, the above-mentioned control unit 40 is constituted so that the adjustment signal corresponding to the color tone which sets up a desired color tone and was set up may be outputted. In addition, when the operation tongue about each color is operated, you may make it a control unit 40 output the adjustment signal about each color. In this case, since the adjustment signal about each color is inputted, it becomes unnecessary color-separation processing the color tone ready section 30.

[0025] The color display 10 by this invention operation gestalt is constituted as mentioned above, and in using it, a user sets up a desired color tone by the control unit 40 first. Thereby, the adjustment signal corresponding to a desired color tone is inputted into the color tone ready section 30 from a control unit 40, and the drive control signal of each color corresponding to a desired color tone is inputted into the mechanical component 20 of a color which corresponds, respectively from the color tone ready section 30. And when drive control of each Light Emitting Diode chips 11r, 11g, and 11b is carried out by the mechanical component 20, light is emitted by proper luminous intensity and outgoing radiation of the light of each color which carried out outgoing radiation from each Light Emitting Diode chips 11r, 11g, and 11b is carried out along the almost same optical-axis top. Thereby, since outgoing radiation of the light of each color is carried out to the exterior in the mutual almost same luminous-intensity-distribution property through the closure resin 15, Gap d, and a lens 16, the color display of a mixed light which does not have color nonuniformity as a whole is performed by mixing the light of each color equally as a whole.

[0026] Drawing 7 shows the composition of the second operation gestalt of the color display by this invention. In drawing 7 , if a point equipped with the sensor 51 and the converter 52 is removed instead of the control unit 40 in the color display 10 shown in drawing 1 , the color

display 50 is the same composition as the color display 10, and omits these explanation by giving the same sign to the same component part.

[0027] Although a sensor 51 detects various situations, and corresponds to a situation, a detecting signal is outputted and various sensors, such as a temperature sensor, a humidity sensor, a pressure sensor, a magnetometric sensor, an ultrasonic sensor, and a pyroelectric sensor, are used, the following explanation explains the case of a temperature sensor.

[0028] Based on the detecting signal from a sensor 51, a converter 52 is changed into the change signal of the proper level range, and it is constituted so that it may output to the color tone ready section 30 as an adjustment signal. In addition, only in level change of conversion of the detecting signal of a sensor 51, amplifier or an attenuator is used as a converter 52. In this way, the adjustment signal changed by the converter 52 is set up so that a color tone which changes from blue to red may be shown as temperature becomes high so that the temperature which a temperature sensor 51 should detect is high as shown in drawing 8 for example, and it may become a color tone with high frequency namely.

[0029] According to the color display 50 of such composition, temperature, such as atmospheric temperature, is detected by the temperature sensor 51, and the detecting signal corresponding to the temperature at that time is outputted from a temperature sensor 51. And when this detecting signal is changed by the converter 52, an adjustment signal is outputted to the color tone ready section 30. Thereby, from the color tone ready section 30, if the drive control signal of each color corresponding to the above-mentioned adjustment signal is inputted into the mechanical component 20 of a color which corresponds, respectively, drive control will be carried out by the mechanical component 20, and each Light Emitting Diode chips 11r, 11g, and 11b will emit light by proper luminous intensity. Therefore, the color display of the color tone corresponding to the atmospheric temperature at that time is performed by mixing the light of each color which carried out outgoing radiation from each Light Emitting Diode chips 11r, 11g, and 11b. And when the color display of the color more near blue is performed when atmospheric temperature changed and temperature falls corresponding to this change, and temperature rises, the color display of the color more near red is performed. Thus, atmospheric temperature is visually expressed by color display by performing the color display from which a color tone changes corresponding to change of atmospheric temperature which is used, for example in the weather report and weather situation in television broadcasting, a newspaper, etc. Since outgoing radiation of the light of each color which carried out outgoing radiation is carried out along the almost same optical-axis top from each Light Emitting Diode chips 11r, 11g, and 11b in that case, outgoing radiation of the light of each color is carried out to the exterior in the mutual almost same luminous-intensity-distribution property. For this reason, the color display of a mixed light which does not have color nonuniformity as a whole is performed by mixing the light of each color equally as a whole.

[0030] It is clear that it sets in the operation gestalt mentioned above, and the Light Emitting Diode chip of three colors which carry out outgoing radiation of the light of not only this but a mutually different color may be used although the red, the green, and the blue Light Emitting Diode chips 11r, 11g, and 11b which carry out outgoing radiation of the light of light in three primary colors as Light Emitting Diode chips of the 3 color light emitting device 11 are used. Moreover, although the 3 color light emitting device 11 is equipped with the Light Emitting Diode chips 11r, 11g, and 11b of three colors the piece every, respectively, you may make it mutually equipped with the Light Emitting Diode chips 11r, 1g, and 11b of the same number in the above-mentioned operation gestalt. According to this invention, the various equipments which met the chromaticity diagram announced in CIE (Commission Internationale de l'Eclariage) using the sensor are realizable.

[0031]

[Effect of the Invention] Along with the almost same optical axis, outgoing radiation of the light which carried out outgoing radiation from each light emitting diode chip since three sorts of light emitting diode chips which carry out outgoing radiation of a color which is [like] mutually [within a 3 color light emitting device] different according to this invention and a desirable light of each color in three primary colors of light which were described above approached mutually and

it had them on the same axle mostly is carried out. Thereby, the luminous-intensity-distribution property of the light of each color which carries out outgoing radiation from each light emitting diode chip becomes almost the same. Therefore, since the color tone by the mixed light of the light from each light emitting diode chip of a 3 color light emitting device is arbitrarily set up when the color tone ready section carries out drive control of the mechanical component corresponding to each light emitting diode chip suitably, there is almost no color nonuniformity and the color display of a desired exact color tone is obtained as a whole. Thus, according to this invention, the extremely excellent color display use [display] Light Emitting Diode, and there is [display] no color nonuniformity, and it was made to make the light of a desired color tone emit light correctly will be offered.

[Translation done.]